

**ABSTRACT**

Apparatus for tracking an object includes a plurality of field generators, which generate electromagnetic fields at different, respective frequencies in a vicinity of the object, and a radio frequency (RF) driver, which radiates a RF driving field toward the object. A wireless transponder is fixed to the object. The transponder includes at least one sensor coil, in which a signal current flows responsive to the electromagnetic fields, and a power coil, which receives the RF driving field and conveys electrical energy from the driving field to power the transponder. The power coil also transmits an output signal responsive to the signal current to a signal receiver, which processes the signal to determine coordinates of the object.